

REMARKS

At the outset, applicants note that the Office Action of December 19, 2003 was considered to be incomplete in that a copy of Weinberger et al (USPAT 2002/01955555 A1) cited in paragraph 5 at page 4 of the Office Action was not forwarded with the Office Action, and not listed on PTO-892 accompanying the Office Action. As evident by the communication forwarded by the Examiner dated February 17, 2004, on January 6, 2004, the undersigned attorney contacted the Examiner in charge of this application requesting a copy of the missing reference. In an effort to expedite prosecution, the undersigned attorney requested that the Examiner immediately forward the missing reference, while indicating that there would be no need to restart the period for response, since the undersigned attorney would immediately forward the missing reference to applicant and additional paperwork would be avoided. Although the Examiner agreed to immediately forward the missing reference, as evident from the communication of February 17, 2004, approximately one and a half months after the telephone conversion of January 6, 2004, the missing reference was forwarded at a time at which only one month remained in the shortened statutory period for response.

The undersigned attorney contacted both the Examiner, Mr. Souw, and the Supervisory Patent Examiner, Mr. Lee, advising that this action by the Examiners and the U.S. Patent and Trademark Office in delaying forwarding of the missing reference was improper and contrary to the U.S. Patent and Trademark Office announced policy of "customer service". The undersigned attorney was advised that since a request in writing had not been submitted formally requesting the missing reference and requesting restarting of the period for response, the period for response could not be restarted. After further communications with the Supervisory Patent Examiner, the Supervisory Patent Examiner indicated that although he was not authorized to restart the period for response, in view of the situation in which the forwarding of the missing reference was delayed, even though the Supervisory

Patent Examiner indicated that such delay was the normal delay of the U.S. Patent and Trademark Office, he could send out a new Office Action and the period for response would run from the date of mailing of the new Office Action. The undersigned attorney requested that a new action be issued and was advised that such action would be taken. However, to date, a new Office Action has not been issued and therefore, irrespective of the unreasonable delay by the U.S. Patent and Trademark Office, the shortened statutory period for response expires on this date, March 19, 2004, and this amendment is being submitted on such date.

By the above amendment, an informality in the specification has been corrected, and the claims have been amended to clarify features of the present invention. Additionally, new claims 12-15 have been presented, wherein claim 15 is a new independent claim. Further, the abstract has been amended so as to provide an abstract in proper format.

At the outset, applicants note that the present invention is directed to a mass spectrometer and a mass spectrometric method in which intermittently-introduced bath gas is introduced through a gas introduction hole into an ion trap at a particular position and a timing of such introduction. More particularly, in accordance with the present invention, as recited in independent claim 1 as well as the other independent claims of this application, a gas introduction hole is arranged in a ring electrode or an endcap electrode of an ion trap for introducing an intermittently-introduced bath gas into the ion trap, wherein the center axis of the gas introduction hole is arranged so as to pass through the center of the ion trap. Applicants note that in accordance with the present invention, in the operation of mass spectrometry in the ion trap, there are four process sequences including the sequence of the ion accumulation process, the precursor ion accumulation process, the ion dissociation process, and the ion detection process in which dissociated ions are ejected from the ion trap for detection, as described, for example, at page 27, lines 15-21 and the further description at page 27, line 22 et. seq.

As illustrated in Fig. 1 of the drawings of this application and as described at page 11, lines 18-28 of the specification, the ring electrode 9 is provided with a hole having inner diameter d and a pulsed valve 44 using a solenoid capable of switching at high speed below 1ms is provided in the hole to be communicated therewith, such that the pulsed valve 44 is opened and closed to introduce an intermittently-introduced bath gas in a collisional activated dissociation process of precursor ions for conducting CID (collisional-induced dissociation). As described at page 13, lines 7-27 of the specification, the ions introduced into the ion trap and cooled by collision with continuously introduced bath gas are focused onto region O of a relatively small sphere centered at the center of gravity of the ion trap having the lowest potential and by locating the hole provided in the ring electrode 9 in the manner indicated, the molecular flow of the intermittently-introduced bath gas for conducting CID introduced from the hole provided in the ring electrode 9 via the pulsed valve 44 collides directly with the region indicated by O so that the intermittently-introduced bath gas and the ions interact efficiently. Thus, as apparent from Fig. 1, the center axis of the gas introduction hole in the ring electrode 9 through which intermittently-introduced bath gas is introduced into the ion trap is arranged so as to pass through the center of the ion trap.

In contradistinction, as described at page 14, lines 16-18 of the specification of this application in connection with Fig. 2 of the drawings of this application, which is representative of the prior art, "the pulsed valve 44 controlling introduction of the intermittently-introduced bath gas is provided in the position to avoid the ring electrode 9." (emphasis added). On the other hand, as described at page 14, lines 20-25 of the specification, according to the present invention, as is apparent from comparison of Fig. 2 with Fig. 1, the molecular flow of the intermittently-introduced bath gas introduced via the pulsed valve 44 collides directly with the region O into which the ions gather at high density. Such obtains improved operation as illustrated in Fig. 3 of the drawings of this application, and it is apparent that the bath gas

introduction hole of the prior art of Fig. 2 is not arranged so that the center axis of the gas introduction hole passes through the center of the ion trap, as recited in the claims of this application.

Applicants note that Fig. 18 illustrates a different embodiment of the present invention, wherein the gas introduction hole is arranged in the endcap electrode 7a with the pulsed valve 44 supplying the intermittently-introduced bath gas through the introduction hole having the center axis thereof arranged to pass through the center of the ion trap, as illustrated and described in the specification of this application. In accordance with different embodiments of the present invention, as described at page 27, line 10 to page 29, line 23, page 37, line 15 to page 39, line 9 and page 41, line 28 to page 43, line 16 of the specification of this application, the intermittently-introduced bath gas is introduced through the gas introduction hole into the ion trap one of (a) during the accumulating of ions generated by the ions source and the isolating of precursor ions from the accumulated ions and (b) during the dissociating of the isolated precursor ions. Applicants submit that the features as described above are clearly set forth in the independent and dependent claims of this application, and that such features are not disclosed or taught in the cited art, as will become clear from the following discussion.

The rejection of claims 1-3, 5 and 7-11 under 35 U.S.C. 102(b) as being anticipated by Doroshenko et al (USPAT. 5,399,857); the rejection of claim 4 under 35 U.S.C. 103(a) as being unpatentable over Doroshenko et al further in view of Weinberger et al (USPAT 20002/0195555 A1); and the rejection of claim 6 under 35 U.S.C. 103(a) as being unpatentable over Doroshenko et al further in view of Ramsey et al (USPAT 6,469,298); such rejections are traversed insofar as they are applicable to the present claims, and reconsideration and withdrawal of the rejections are respectfully requested.

As to the requirements to support a rejection under 35 U.S.C. 102, reference is made to the decision of In re Robertson, 49 USPQ 2d 1949 (Fed. Cir. 1999),

wherein the court pointed out that anticipation under 35 U.S.C. §102 requires that each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference. As noted by the court, if the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if the element is "inherent" in its disclosure. To establish inherency, the extrinsic evidence "must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Moreover, the court pointed out that inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.

With regard to the requirements to support a rejection under 35 U.S.C. 103, reference is made to the decision of In re Fine, 5 USPQ 2d 1596 (Fed. Cir. 1988), wherein the court pointed out that the PTO has the burden under §103 to establish a prima facie case of obviousness and can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. As noted by the court, whether a particular combination might be "obvious to try" is not a legitimate test of patentability and obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. As further noted by the court, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

Furthermore, such requirements have been clarified in the recent decision of In re Lee, 61 USPQ 2d 1430 (Fed. Cir. 2002) wherein the court in reversing an obviousness rejection indicated that deficiencies of the cited references cannot be remedied with conclusions about what is "basic knowledge" or "common knowledge". The court pointed out:

The Examiner's conclusory statements that "the demonstration mode is just a programmable feature which can be used in many different device[s] for providing automatic introduction by adding the proper programming software" and that "another motivation would be that the automatic demonstration mode is user friendly and it functions as a tutorial" do not adequately address the issue of motivation to combine. This factual question of motivation is immaterial to patentability, and could not be resolved on subjected belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher."... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion. (emphasis added)

In setting forth the rejection based upon Doroshenko et al, the Examiner contends that this patent discloses a mass spectrometer showing in Fig. 5, comprising "(c) a gas introduction hole in the endcap electrode, as can be seen in Fig. 5, for introducing an intermittently-introduced bath gas into the ion trap..." and "(e) the limitation that the center axis of the gas introduction hole is arranged so as to pass through the center of the ion trap is inherent in Doroshenko's, as is self-obvious in Fig. 5", with the Examiner further indicating that with regard to claim 2, "Doroshenko's gas introduction hole is arranged in the ring electrode, as shown in the embodiment of Fig. 4..." and that with regard to claim 3, "Doroshenko's gas introduction hole is arranged in one of the endcap electrodes, as can be seen in Fig. 5...". Applicants submit that the Examiner has mischaracterized the disclosure of Doroshenko et al, and irrespective of the position set forth by the Examiner, Doroshenko et al does not disclose in the sense of 35 U.S.C. 102 a gas introduction hole arranged in the ring electrode or the endcap electrode of the ion trap for introducing an intermittently-introduced bath gas into the ion trap wherein the center axis of the gas introduction hole is arranged so as to pass through the center of the ion trap, as recited in each of the independent claims of this application. More

particularly, while col. 2, lines 40-47 of Doroshenko et al, describes that a feature of a conventional ion trap is presence of helium buffer gas within the trap, there is no disclosure or teaching in Doroshenko et al of the manner of introduction of such helium buffer gas into the ion trap, assuming arguendo that such represents a bath gas, or that such helium buffer gas is intermittently-introduced. Applicants submit that what the Examiner refers to as a gas introduction hole in Figs. 4 and 5 of Doroshenko et al is, in fact, described in Doroshenko et al as an "ion introduction hole" (emphasis added). That is, referring to col. 4, lines 54-58 of Doroshenko et al, "As shown diagrammatically in Fig. 4, ions formed external to the ion trap may be introduced into the trapping field through a hole in the ring electrode or a hole in one of the endcaps or through the space between the electrodes." (emphasis added). There is no disclosure or teaching in Doroshenko et al of a gas introduction hole in the ring electrode or the endcap electrode for introducing an intermittently-introduced bath gas into the ion trap or that the center axis of the gas introduction hole is arranged so as to pass through the center of the ion trap, as recited in the independent and dependent claims. Thus, applicants submit that all claims patentably distinguish over Doroshenko et al and should be considered allowable at this timee..

With regard to the Examiner's contention concerning features being "inherent in Doroshenko's", reference is made to In re Robertson, supra, as to the requirements for showing inherency. Thus, applicants submit that Doroshenko et al fails to disclose or teach the recited features of the independent and dependent claims of this application in the sense of 35 U.S.C. 102 and 35 U.S.C. 103, and all claims should be considered allowable thereover.

Applicants note that some of the independent and dependent claims further define features of the location of the introduction hole as well as the operation of the introduction of the intermittently-introduced bath gas. For example, independent claims 9 and 10, further define the feature that an intermittently-introduced bath gas

is introduced through a gas introduction hole arranged in the ring electrode having a center axis almost orthogonal to an axis connecting the center axis of the incidence hole and the center axis of the ejection hole which are arranged in the opposing endcap electrodes, which features are not disclosed or taught in the cited art, again noting that the holes referred to in Doroshenko et al in the various electrodes represent ion introduction holes or ejection holes or the like. As such, applicants submit that all claims patentably distinguish over Doroshenko et al with respect to the intermittently-introduced bath gas introduction hole and the location thereof in the sense of 35 U.S.C. 102 and 35 U.S.C. 103.

Additionally, applicants note that the independent and dependent claims further define features of the timing of introduction of the intermittently-introduced bath gas into the ion trap which features are again not disclosed by Doroshenko et al. Thus, these claimed features further patentably distinguish over Doroshenko et al and all claims should be considered allowable thereover.

As to the combination of Doroshenko et al with Weinberger et al, the Examiner contends that Doroshenko et al show all the limitations of claim 4, except the recitation of the bath gas being introduced via a pulsed valve using a solenoid, and as pointed out above, the Examiner's position has no basis in fact or, in supposition. In any event, the Examiner contends that it would be obvious to introduce Doroshenko's bath gas via a pulsed valve using a solenoid as taught by Weinberger et al, and applicants note that Weinberger et al fails to disclose or teach introduction of a bath gas through an introduction hole positioned in the manner set forth irrespective of whether or not such is introduced utilizing a solenoid valve. More particularly, the section [0134] referred to by the Examiner in Weinberger et al, refers to controlled evacuation of atmospheric gas using vacuum compatible valves which are electrically controlled solenoid valves. Thus, applicants submit that Weinberger et al fails to overcome the deficiencies of Doroshenko et al in the sense of 35 U.S.C. 103 and applicants submit that the Examiner has engaged in a

hindsight reconstruction attempt in complete disregard of the teachings of the individual references, utilizing the principle of "obvious to try" which is not the standard of 35 U.S.C. 103. See In re Fine, supra. Thus, applicants submit that claim 4 patentably distinguishes over this proposed combination of references in the sense of 35 U.S.C. 103 and should be considered allowable thereover.

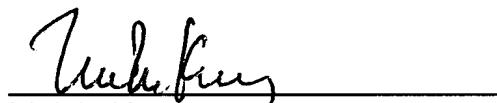
As to the rejection of claim 6 based upon the combination of Doroshenko et al and Ramsey et al, the Examiner contends that Doroshenko et al show all the limitations of claim 6, as applied previously to the parent claim 1, except the recitation of "a distance from the front edge of the gas introduction hole to the center of the ion trap being less than 16 mm". Applicants submit that as pointed out above, Doroshenko et al fails to disclose the recited features of parent claim 1 as well as the recited features of claim 6. The Examiner contends that it would be obvious to make the distance from the front edge of the gas introduction hole to the center of the ion trap less than 16 mm, apparently based upon the disclosure of Ramsey et al. However, Ramsey et al, like Doroshenko et al, fails to disclose or teach a gas introduction hole as claimed. Rather, applicants submit that as described in col. 3, lines 5-8 of Ramsey et al, "the centrally located holes in ring electrode 12, endcaps 14 and 16 and insulators 18 and 20 are preferably coaxially and symmetrically aligned about a vertical axis (not shown), to permit laser access and ion injection." (emphasis added). Thus, Ramsey et al also fails to overcome the deficiencies of Doroshenko et al, as pointed out above, and also fails to disclose or teach the recited feature of claim 6 in the sense of 35 U.S.C. 103. Hereagain, the Examiner has engaged in a hindsight reconstruction attempt in complete disregard of the teachings of the individual references, utilizing the principle of "obvious to try". See also In re Lee, supra. Thus, applicants submit that the features of claim 6 patentably distinguish over the cited art in the sense of 35 U.S.C. 103, irrespective of the decision cited by the Examiner and claim 6 should be considered allowable thereover.

As noted above, the independent and dependent claims recite features not disclosed or taught in the cited art, and applicants submit that each of independent claims 1, 7, 9, 10, 11 and 15 recite features not disclosed or taught in the cited art taken alone or in any combination thereof and all claims patentably distinguish thereover, and should now be in condition for allowance.

In view of the above amendments and remarks, applicants submit that all claims present in this application patentably distinguish over the cited art and should now be in condition for allowance. Accordingly, issuance of an action of a favorable nature is courteously solicited.

To the extent necessary, applicant's petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (520.42838X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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